CLAIMS

We claim:

1. A method for fabrication of ferroelectric capacitor elements of an integrated circuit comprising the steps of:

deposition of an electrically conductive bottom 5 electrode layer;

deposition of a layer of ferroelectric dielectric material;

annealing the layer of ferroelectric dielectric material with a first anneal;

deposition of an electrically conductive top electrode layer; and

annealing the layer of ferroelectric dielectric material with a second anneal, the second anneal being performed by rapid thermal annealing and performed

15 after the step of deposition of an electrically conductive top electrode layer.

- 2. The process of Claim 1, wherein the electrically conductive bottom electrode layer comprises a noble metal.
- 3. The process of Claim 2, wherein the electrically conductive bottom electrode layer comprises platinum.
- 4. The process of Claim 1, wherein the ferroelectric dielectric layer comprises PZT.
- 5. The process of Claim 1 wherein the electrically conductive top electrode layer comprises a noble metal oxide.

- 6. The process of Claim 5 wherein the electrically conductive top electrode layer comprises Iridium Oxide.
- 7. The process of Claim 5 wherein the first anneal comprises a rapid thermal anneal at a temperature between five hundred twenty five and six hundred degrees celsius.
- 8. The process of Claim 7, wherein the first anneal is performed at a temperature of approximately five hundred seventy five degrees celsius for a time between sixty and one hundred twenty seconds.
- 9. The process of Claim 7 wherein the second anneal 'is performed at a temperature of between seven hundred and seven hundred fifty degrees celsius.
 - 10. The process of Claim 9, wherein the second anneal is performed at a temperature of approximately seven hundred twenty five degrees celsius for a duration of greater than ten seconds.
 - 11. The process of Claim 10, wherein the second anneal is performed for a duration of approximately twenty seconds.
 - 12. A method for fabrication of ferroelectric capacitor elements of an integrated circuit comprising the steps of:
- deposition of an electrically conductive bottom 5 electrode layer comprising a noble metal;

deposition of a layer of ferroelectric dielectric material;

annealing the layer of ferroelectric dielectric material with a first anneal;

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deposition of an electrically conductive top electrode layer comprising a noble metal oxide; and

annealing the layer of ferroelectric dielectric material with a second anneal, the second anneal being performed by rapid thermal annealing and performed after the step of deposition of an electrically conductive top electrode layer.

- 13. The process of Claim 12, wherein the electrically conductive bottom electrode layer comprises platinum.
- 14. The process of Claim 12, wherein the ferroelectric dielectric layer comprises PZT.
- 15. The process of Claim 12 wherein the first anneal is performed in an environment comprising oxygen, the oxygen having partial pressure of less than ten percent of one atmosphere.
 - 16. The process of Claim 15 wherein the first anneal is performed in an environment comprising oxygen at a partial pressure of approximately five percent.
 - 17. The process of Claim 15 wherein the first anneal is performed in an environment comprising a mixture of oxygen and inert gas.
 - 18. The process of Claim 12 wherein the second anneal is performed in an environment comprising a partial pressure of oxygen at a partial pressure of less than five percent of one atmosphere.
 - 19. The process of Claim 18 wherein the second anneal is performed in an environment comprising oxygen at a partial pressure of approximately one percent.

- 20. The process of Claim 18 wherein the first anneal is performed in an environment comprising a mixture of oxygen and inert gas.
- 21. The process of Claim 18, further comprising the step of:

depositing an encapsulation layer; and

wherein the second anneal is performed after the step of depositing an encapsulation layer.

- 22. The process of Claim 21 wherein the second anneal is performed at a temperature of between seven hundred and seven hundred fifty degrees celsius for a time not less than ten seconds.
- 23. The process of Claim 22 wherein the ferroelectric dielectric layer comprises PZT.
- 24. The process of Claim 23 wherein the step of depositing the ferroelectric dielectric layer is performed by sputtering.
- 25. A ferroelectric capacitor comprising:
 - a adhesion layer comprising titanium dioxide,
 - a bottom electrode comprising platinum,
- a ferroelectric dielectric layer comprising PZT; 5 and
 - a top electrode layer comprising Iridium Oxide.
 - 26. The ferroelectric capacitor of Claim 25, wherein the ferroelectric dielectric layer comprises grains having a typically columnar structure and has a clear demarcation at an interface between the ferroelectric dielectric layer and the top electrode layer.